Report from the Airplane Performance Harmonization Working Group

Issue: Short Landing Operations

1 - What is underlying safety issue to be addressed by the FAR/JAR? [Explain the underlying safety rationale for the requirement. Why should the requirement exist? What prompted this rulemaking activity (e.g., new technology, service history, etc.)?]

For the purpose of dispatching an aircraft to a destination airport, the FAR requires that the aircraft can be brought to a full stop within 60% of the available runway length, assuming a 50 ft threshold crossing height. The JAR allows an operator to receive special approval to base the landing field length weight on a 50 ft crossing height over a runway safety area prior to reaching the runway threshold. This is essentially a clearway used for landing, which would allow the touchdown to occur prior to the normal touchdown point on the runway.

The JAR provides this relief in order to accommodate some of the existing commuter aircraft operations onto extremely short runways, which would not be possible without the relief provided by the JAR.

2 - What are the current FAR and JAR standards relative to this subject? [Reproduce the FAR and JAR rules text as indicated below.]

Current FAR text:

Part 121

§ 121.195 Airplanes: Turbine engine powered: Landing limitations: Destination airports.

(b) Except as provided in paragraph (c), (d), or (e) of this section, no person operating a turbine engine powered airplane may take off that airplane unless its weight on arrival, allowing for normal consumption of fuel and oil in flight (in accordance with the landing distance set forth in the Airplane Flight Manual for the elevation of the destination airport and the wind conditions anticipated there at the time of landing), would allow a full stop landing at the intended destination airport within 60 percent of the effective length of each runway described below from a point 50 feet above the intersection of the obstruction clearance plane and the runway.

§ 121.197 Airplanes: Turbine engine powered: Landing limitations: Alternate airports.

No person may list an airport as an alternate airport in a dispatch or flight release for a turbine engine powered airplane unless (based on the assumptions in § 121.195 (b)) that airplane at the weight anticipated at the time of arrival can be brought to a full stop landing within 70 percent of the effective length of the runway for turbopropeller

powered airplanes and 60 percent of the effective length of the runway for turbojet powered airplanes, from a point 50 feet above the intersection of the obstruction clearance plane and the runway. In the case of an alternate airport for departure, as provided in § 121.617, allowance may be made for fuel jettisoning in addition to normal consumption of fuel and oil when determining the weight anticipated at the time of arrival.

Part 135

§ 135.385 Airplanes: Large transport category airplanes: Turbine engine powered: Landing limitations: Destination airports.

(b) Except as provided in paragraph (c), (d), or (e) of this section, no person operating a turbine engine powered large transport category airplane may take off that airplane unless its weight on arrival, allowing for normal consumption of fuel and oil in flight (in accordance with the landing distance set forth in the Airplane Flight Manual for the elevation of the destination airport and the wind conditions anticipated there at the time of landing), would allow a full stop landing at the intended destination airport within 60 percent of the effective length of each runway described below from a point 50 feet above the intersection of the obstruction clearance plane and the runway.

§ 135.387 Airplanes: Large transport category airplanes: Turbine engine powered: Landing limitations: Alternate airports.

No person may select an airport as an alternate airport for a turbine engine powered large transport category airplane unless (based on the assumptions in § 135.385 (b)) that airplane, at the weight anticipated at the time of arrival, can be brought to a full stop landing within 70 percent of the effective length of the runway for turbopropeller-powered airplanes and 60 percent of the effective length of the runway for turbojet powered airplanes, from a point 50 feet above the intersection of the obstruction clearance plane and the runway.

Current JAR text:

JAR-OPS 1.515 Landing – Dry Runways (See AMC OPS 1.510 and 1.515)

(a) An operator shall ensure that the landing mass of the aeroplane determined in accordance with JAR-OPS 1.475(a) for the estimated time of landing at the destination aerodrome and at any alternate aerodrome allows a full stop landing from 50 ft above the threshold:

(1) For turbo-jet powered aeroplanes, within 60% of the landing distance available; or

(2) For turbo-propeller powered aeroplanes, within 70% of the landing distance available.

(3) For Steep Approach procedures the Authority may approve the use of landing distance data factored in accordance with subparagraphs (a)(1) and (a)(2) above as appropriate, based on a screen height of less than 50 ft, but not less than 35 ft. (See Appendix 1 to JAR-OPS 1.515(a)(3).).

(4) When showing compliance with sub-paragraphs (a)(1) and (a)(2) above, the Authority may exceptionally approve, when satisfied that there is a need (see Appendix 1), the use of Short Landing Operations in accordance with Appendices 1 and 2 together with any other supplementary conditions that the Authority considers necessary in order to ensure an acceptable level of safety in the particular case.

Appendix 1 to JAR-OPS 1.515(a)(4) Short Landing Operations

(a) For the purpose of JAR-OPS 1.515(a)(4), the distance used for the calculation of the permitted landing mass may consist of the usable length of the declared safety area plus the declared landing distance available. The Authority may approve such operations in accordance with the following criteria:

(1) Demonstration of the need for Short Landing Operations. There must be a clear public interest and operational necessity for the operation, either due to the remoteness of the airport or to the physical limitations relating to extending the runway.

(2) Aeroplane and Operational Criteria.

(i) Short landing operations will only be approved for aeroplanes where the vertical distance between the path of the pilot's eye and the path of the lowest part of the wheels with the aeroplane established on the normal glide path does not exceed 3 metres.

(ii) When establishing aerodrome operating minima the visibility/RVR must not be less than 1.5 km. In addition, wind limitations must be specified in the Operations Manual.

(iii) Minimum pilot experience, training requirements and special aerodrome familiarisation must be specified for such operations in the Operations Manual.

(3) It is assumed that the crossing height over the beginning of the usable length of the declared safety area is 50 ft.

(4) Additional Criteria. The Authority may impose such additional conditions as are deemed necessary for a safe operation taking into account the

aeroplane type characteristics, geographic characteristics in the approach area, available approach aids and missed approach/balked landing considerations. Such additional conditions may be, for instance, the requirement for VASI/PAPI-type visual slope indicator system.

Appendix 2 to JAR-OPS 1.515(a)(4) Airfield Criteria for Short Landing Distance

(a) The use of the safe area must be approved by the airport authority.
(b) The usable length of the declared safe area under the provisions of 1.515(a)(4) and this Appendix must not exceed 90 metres.
(c) The width of the declared safe area shall not be less than twice the runway width or twice the wing span, whichever is greater, centred on the extended runway centre line.
(d) The declared safe area must be clear of obstructions or depressions which would endanger an aeroplane undershooting the runway and no mobile objects shall be permitted on the declared safety area while the runway is being using for short landing operations.
(e) The slope of the declared safety area must not exceed 5% upward nor 2% downward in the direction of landing.
(f) For the purpose of this operation, the bearing strength requirement of JAR-OPS 1.480(a)(5) need not apply to the declared safety area.

2a – If no FAR or JAR standard exists, what means have been used to ensure this safety issue is addressed? [Reproduce text from issue papers, special conditions, policy, certification action items, etc., that have been used relative to this issue]

N/A

3 - What are the differences in the FAA and JAA standards or policy and what do these differences result in? [Explain the differences in the standards or policy, and what these differences result in relative to (as applicable) design features/capability, safety margins, cost, stringency, etc.]

Currently, the Part 121/135 operating rules do not allow the use of a landing clearway when calculating landing field length performance. The performance calculation must be based on a 50 ft crossing height at the runway threshold. In contrast to the FAA requirements, the JAR does specifically allow operators to take credit for a 50 ft crossing height prior to reaching the threshold of the runway, provided that it occurs over a well-defined runway safety area.

The FAR standards provide a higher level of safety than the JAR when operating to shorter runways, although this higher standard may prevent operations altogether by not allowing a particular aircraft to operate at all to an extremely short runway. However, this regulation only applies to commuter aircraft, and therefore there is no competitive economic advantage for a JAR operator (or economic disadvantage for an FAA operator)

since an FAR operator would never be operating the same aircraft into the same airport as the JAR operator.

4 - What, if any, are the differences in the current means of compliance? [Provide a brief explanation of any differences in the current compliance criteria or methodology (e.g., issue papers), including any differences in either criteria, methodology, or application that result in a difference in stringency between the standards.]

N/A – The FAR does not contain a standard for determining field length landing performance based on a landing clearway, so there is no applicable means of compliance.

5 – What is the proposed action? [Describe the new proposed requirement, or the proposed change to the existing requirement, as applicable. Is the proposed action to introduce a new standard, or to take some other action? Explain what action is being proposed (not the regulatory text, but the underlying rationale) and why that direction was chosen for each proposed action.]

The proposed action is to not harmonize to the JAR standard. This requirement was added to the JAR regulation to cover commuter aircraft operations that were already occurring within some of the European countries. According to the JAA, an operator would need to show the authority that there is a strong economic need to using a short landing operation to service an airport. Within the US, an operator could request an exemption in order to achieve the lower landing criteria. Since this addresses a very narrow operational scope (small aircraft into small airports), there is no competitive benefit to be lost or gained by adopting this rule into the FAR.